

REMARKS

Claims 1-13 and 22-27 are the claims pending in the application. Applicants have incorporated claim 21 into claim 1, and thus have canceled claim 21 without prejudice or disclaimer. Claims 1-13 and 21-27 are rejected on prior art grounds. Applicants respectfully traverse the prior art rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1-3, 5, 7, 8 and 27, are rejected under 35 U.S.C. 102(e) as anticipated by Desilets, et al. ("Desilets")(U.S. 2004/0040637 A1). Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desilets in view of Becuwe ("Becuwe") (U.S. 5,034,072). Claims 6 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desilets. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desilets in view of Nix, et al. ("Nix") (U.S. 3,389,025). Claims 11-13 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desilets in view of Levinthal ("Levinthal") (U.S. 4,086,110). Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desilets in view of Adams ("Adams") (U.S. 7,025,840 B1).

A. The Desilets, Becuwe, Nix, and Levinthal References

As indicated above and below, Applicant has incorporated claim 21 into independent claim 1. Accordingly, based on the Office Action, the above references, alone or in combination, do not disclose, teach or suggest, Applicants invention as indicated in claim 1. (See Office Action, Pages 2-5).

Please note, regarding claims 6 and 23-25, Applicant traverses the assertion in the Office Action that it would have been obvious to one of ordinary skill in the art to modify the composition by using nanotubes from 300 to 1,000 micrometers. Similarly, Applicant also traverses the assertion in the Office Action that it would have been obvious to one of ordinary skill in the art to modify the composition to possess the characteristics to optimize the use of the material. In both situations, Applicant asserts that a “particular parameter must first be recognized as a result-effective variable before the determination of the optimum of the variable might be characterized.” Since Desilets only discloses a composition, which includes conventional carbon nanotubes, and does not include a nanotubular structure composed of a high energetic material, then Desilets certainly does not recognize the feature of a diameter range of the nanotubular structure or a predetermined diameter wall thickness of the nanotubular structure as a result-effect variable.

B. The Rejection Based on Desilets in view of Adams

Regarding independent claim 1, and related dependent claims 2-13 and 22-27, first the references, separately, or in combination, fail to disclose, teach or suggest a reason or motivation for being combined.

In particular, as previously discussed in the Non-Final Amendment of June 7, 2006, Desilets pertains to a flash-ignitable composition designed to ignite an energetic material when subjected to a flash of light where the composition includes a carbon nanotube structure mixed with an energetic material. (See Previous Amendment).

In contrast, Adams pertains to an explosive, and a related method, comprising fullerene compounds, including carbon nanotubes, nitrated or functionalized with a nitro-

containing compound in order to impart explosive or ordnance characteristics. (See Adams at Abstract; column 2, lines 27-67; Column 3, lines 19-45; and Column 4, lines 26-35).

Nothing within Desilets, which pertains to a flash-ignitable composition mixture activated when subjected to a flash of light, suggests an explosive fullerene material with nitro containing explosive chemical functionality used to form various structures with explosive or ordnance characteristics and minimal weight gain. (See above).

Therefore, one of ordinary skill in the art would not have combined these references absent hindsight.

Second, even assuming that the references would have been combined, Desilets, as indicated above, does not disclose, teach or suggest the features of independent claim 1, and incorporated dependent claim 21, as well as related dependent claims 2-13 and 22-27, including at least one nanotubular structure is composed of at least the high energy material, the high energy material is a melt processible energetic material. (See Application, Page 3, lines 15-19; Page 4, lines 8-11; Page 6, line 16-Page 8, line 2; and Page 8, lines 10-15).

Indeed, Applicant, as indicated above, agrees with the Office Action that Desilets as well as the other references indicated above do not disclose, teach or suggest that at least one nanotubular structure is composed or incorporated of the high energy material as recited in previous claim 21 (incorporated into independent claim 1) and claim 22. (See Office Action, Page 5, lines 3-10).

Adams is also deficient and does not make up for the deficiencies of Desilets.

Instead, Adams merely recites an explosive/energetic fullerene compound, and related method for making the explosive/energetic fullerence compound. In particular, in a “preferred embodiment,” at least one of the fullerene compounds, including a carbon nanotube, is nitrated or functionalized with a nitro compound. Using conventional nitration chemistry involving nitric acid and sulfuric acid, a CHNO (Carbon Hydrogen Nitrogen Oxygen) chemical functionality is added to the fullerene structure, which converts the carbon fullerene structure into an explosive/energetic material (which the Examiner analogizes to Applicant’s claimed nanotube composed from a melt processible energetic material). Accordingly, Adams expressly indicates that the multi-walled nanotubes include an outermost layer, which is ordinarily the only part receiving the chemical functionality, such as, TNT, HMX or RDX. However, the Adam’s reference does not appear to indicate the location of the nitro chemical functionality added to the single-walled nanotubes. Regardless, the resultant structure still includes the underlying carbon (fullerene) nanotube structure with the chemically added nitro moieties not a nanotube structure formed from the eneregetic material like Applicant’s invention. (See Adams at Abstract; Column 2, lines 28-60; Column 3, lines 19-45; and Column 4, lines 5-10 and lines 26-35).

In contrast, and for emphasis, as discussed in the previous amendment of June 7, 2006, Applicant’s claimed invention includes at least one nanotubular structure actually composed of the high energy material, which is a melt, processible energetic material. In particular, in an exemplary embodiment, the nanotubular structure is composed of a melt processible energetic material where the melt, processible energetic material is poured into a mold to form the nanotubular structure. Accordingly, the nanotubular structure is

formed by, for example, molding, or molding and extrusion, of the melt processible energetic material. Thus, Applicant's nanotube structure is actually composed of the melt, processible energetic material without any carbon nanotube, whereas Adams only teaches or suggests adding a nitro group functionality to the existing carbon nanotube (fullerene), which only results in formation of the carbon nanotube with explosive characteristics, not using or adding a melt, processible energetic material. Therefore, Adams does not form a nanotube structure actually composed or formed from a melt, processible energetic material. Thus, Adams clearly does not teach or suggest, including at least one nanotubular structure is composed of at least the high energy material, the high energy material is a melt processible energetic material. (See above).

For at least the reasons outlined above, Applicant respectfully submits that neither Desilets nor Adams, alone or in combination, disclose, teach or suggest including at least one nanotubular structure is composed of at least the high energy material, the high energy material is a melt processible energetic material as recited in independent claim 1 of Applicant's invention.

For the reasons stated above, the claimed invention as defined by independent claim 1, and related dependent claims 2-13 and 22-27, is fully patentable over the cited references.

III. Formal Matters and Conclusions

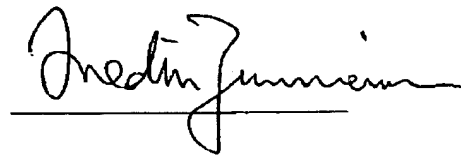
In view of the foregoing, Applicants submit that claims 1-13 and 22-27, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

Please charge any deficiencies and credit any overpayment to Attorney's Deposit Account Number 50-1114.

Respectfully submitted,

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